

Standards and Specifications
for FSA Conservation Practices

The conservation practices listed on the FSA Conservation Practices Code List include:

Standard SCS Practices - (P)

Practices previously reviewed and concurred by the SCS West National Technical Center (WNTC) are covered by existing Standards and Specifications (S&S) in Section IV of the SCS Hawaii Field Office Technical Guide (FOTG). These practices are also covered by SCS National Standards. Several practices are covered by the same Section IV S&S. For example, Practice 22 - Diversion and Practice 23 - Diversion (for Outside Water) are both covered by S&S Code 362 - Diversion. These practices have been separated for FSA planning purposes because the diversions have different functions, costs, and erosion reduction benefits. For FSA planning purposes, practices must be applied according to the applicable Section IV S&S and also, if specified, additional or amended standards and/or specifications. Standard SCS practices are denoted with a (P). The practices are briefly defined and the applicable FOTG S&S are stated below.

Not Previously Identified Treatments - (T)

Several practices currently used by farmers in Hawaii and/or the Pacific Basin have erosion control benefits however, these practices are not covered by existing Section IV S&S. These practices will be referred to as "treatments" to differentiate them from Section IV practices. Standards and, if necessary, specifications for these treatments have been developed and are listed below. Some of these treatments have the same name as practices covered by National Standards, although they are completely different or somewhat different. Other treatments have been given new names. These treatments must be applied according to the standards and specifications listed below in order to get credit for FSA planning purposes. Treatments are denoted with a (T).

The management-type practices and treatments are described first, followed by the structural-type, and other practices and treatments.

MANAGEMENT PRACTICES AND TREATMENTS

1. Cross Slope Farming - (T)

This treatment is not covered by existing Section IV Standards and Specifications. For FSA planning purposes, this treatment is applicable for sugarcane and truck crop at all field office locations. Following are Standards for this treatment.

STANDARDS

Definition

For sugarcane, managing farming operation in such a way that planting is done across the general slope. For truck crops, managing farming operations in such a way that planting and cultivating are done across the general slope.

Purpose

To reduce erosion and control water.

Conditions Where Treatment Applies

On sloping cropland.

2. Cross Slope Block Farming - (T)

The existing Section IV Standards and Specifications for this treatment have not been officially approved by the WNTC and will therefore, be pulled out of Section IV and included in Section III. The existing Section IV Standards and Specifications, with some minor revisions, are listed below. For FSA planning purposes, this treatment is applicable for sugarcane at all field office locations. It is not applicable for truck crops. Specifications for pineapple are included below although they are not needed for FSA planning purposes.

CROSS SLOPE BLOCK FARMING

Definition

Managing farming operation in such a way that plowing, land preparation and planting are done in predetermined width blocks across the general land slope.

Purpose

To reduce erosion and provide control of runoff water.

Conditions Where Treatment Applies

On all cropland where sugarcane and pineapple are produced that has slopes between 3 to 20 percent or complex slopes where contour farming, terraces, or diversions are not feasible or practical.

SPECIFICATIONS

General

The Universal Soil Loss Equation and other applicable procedures shall be used when Cross Slope Block Farming, alone or in combination with other practices, is an acceptable alternative for reducing soil loss.

Pineapple

Lay out parallel blocks in widths compatible with the length of the servicing boom.

Criteria for block layout:

- 0 to 3 percent slopes - straight line block layout.
- 3 to 10 percent slopes - cross slope block layout with diversion.
- Over 10 percent slopes - cross slope block layout with diversion or terraces.

Design on a grade not to exceed 3 percent.

Where necessary, short runs on slopes up to 6 percent are allowable for lengths not to exceed 200 feet.

Block road criteria:

- Shape to intercept runoff water and carry to a natural drainageway or vegetated waterway.
- Upslope side of cross-slope roads must be 6 inches lower than the downslope side.
- Design blocks to keep roads running in direction of the grade to a minimum.

Sugarcane

Lay out blocks across the predominant slope.

Perform planting operations across the predominant slope.

Vary cane age at least 3 months between vertically adjacent blocks.

Vertical width of blocks should not exceed 500 feet, although widths up to 1,000 feet are permissible if economically defensible.

3. Contour Farming - (P)

Farming sloping land in such a way that preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces or diversions.) See existing FOTG Section IV Code 330 - Contour Farming for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane and truck crops at all field office locations.

4. Contour Farming (with Furrows) - (P)

Farming sloping land in such a way that preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces or diversions.) For FSA planning purposes, this practice also entails forming furrows which follow the contour. FOTG Section IV Standards and Specifications for Code 330 - Contour Farming apply to this practice. This practice is applicable for sugarcane and truck crops at all field office locations.

5. Crop Residue Use - (P)

Using plant residues to protect cultivated fields during critical erosion periods. FOTG Section IV Standards and Specifications Code 344 - Crop Residue Use apply to this practice. Additional Specifications, which set minimum percent surface residue cover required, have been developed for FSA planning purposes and are listed below. Code 344 Standards and Specifications and the additional Specifications must be met in order to get credit for FSA planning purposes.

For FSA planning purposes, this practice is applicable for all types of sugarcane crops at the Pahala Field Office and for seed cane crops only, at all other field offices. At the present time, the use of crop residue on truck crops meets the Code 344 Standards and Specifications and the additional Specifications only as practices on Guam and the CNMI. Thus for FSA planning purposes, this practice is limited to use for truck crops at the Guam and CNMI field offices.

ADDITIONAL SPECIFICATIONS

Crop residue must constitute the following minimum percent surface residue cover at each slope category for soil erosion control. This applies to both sugarcane and truck crops. See Appendix 2 for documentation regarding this specification.

<u>Slope Category</u>	<u>Surface Cover Required</u>
<10%	50%
10 - 20%	60%
>20%	70%

6. Precision Till - (T)

Precision till is a type of conservation till practiced on sugarcane in Hawaii. However, as practiced in Hawaii, it does not meet the Conservation Tillage National Standard requirement of 30 percent or more plant residue cover after planting to reduce erosion by water. Thus, Standards for this treatment will be included in Section III and used for FSA planning purposes only. This treatment is applicable for sugarcane at all field office locations for FSA planning purposes. It is not applicable for truck crops.

STANDARDS

Definition

A tillage or planting system that limits soil disturbance to the actual rows where the seed material is to be planted; shatters restrictive layers below normal plow depth to increase water infiltration; and that reduces the number of passes over the field. This treatment must be carried out on the contour or across the predominant slope.

Purpose

To reduce soil erosion; maintain or develop good soil tilth and efficient moisture use; and improve water penetration and aeration.

Conditions Where Treatment Applies

On sugarcane land to be planted or ratooned.

7. Scheduled Harvesting - (T)

This treatment is not covered by existing Section IV Standards and Specifications. For FSA planning purposes, it is applicable for sugarcane and truck crops at all field office locations. Following are Standards for this treatment.

STANDARDS

Definition

Scheduling planting and harvesting operations during the low rainfall period.

Purpose

To reduce erosion in cleared fields between the harvest operation and reestablishment of a crop.

Conditions Where Treatment Applies

On cropland located in areas with definite high and low rainfall periods.

Planning Considerations

For truck crops, implementation of this treatment would entail not growing any crops at all during the rainy season if short duration crops are grown.

8. Volunteer Cover Crop - (T)

This treatment is not covered by existing Section IV Standards and Specifications. For FSA planning purposes, it is applicable for sugarcane and truck crops at all field office locations. Following are Standards for this treatment.

STANDARDS

Definition

Maintaining and managing naturally occurring vegetation on cropland to protect the soil from erosion.

Purpose

To protect the soil from erosion during periods when the major crops do not furnish adequate cover.

Conditions Where Treatment Applies

On cropland where plant cover is needed for soil protection.

Planning Considerations

For sugarcane, the vegetation must be maintained from harvest until a minimum 25 percent canopy is established by the subsequent sugarcane crop. For truck crops, the vegetation must be maintained from harvest until tillage for the subsequent crop takes place.

9. Cover and Green Manure Crop - (P)

A crop of close-growing grasses, legumes, or small grain grown primarily for seasonal protection and soil improvement. It usually is grown for 1 year or less, except where there is permanent cover as in orchards. FOTG Section IV Standards and Specifications Code 340 - Cover and Green Manure Crop apply to this practice. Additional Standards and Specifications have been developed for FSA planning purposes and are listed below. Both Code 340 and the additional Standards and Specifications must be met in order to get credit for FSA planning purposes. This practice is applicable for sugarcane and truck crops at all field office locations for FSA planning purposes.

Additional Standards:

Planning Considerations

For sugarcane, a cover crop is required for plow-plant crops only. The cover crop must be planted as soon as possible after harvest of the last ratooned crop and maintained until a minimum 25 percent canopy is established by the subsequent plow-plant crop. For truck crops, a cover crop is required to be planted at least once per year. The cover crop must be planted as soon as possible after harvest and maintained until tillage for the subsequent crop takes place.

Additional Specifications:

TABLE 3.—Cover Crop Plants for Interseeding in Sugarcane

Species and Cultivars	Seeding Rates $\frac{1}{2}$ / lbs. PLS/Ac	pH Range	Inoculant Group	Optimum Planting Time
LEGUMES:				
Clover, crimson (<i>Trifolium incarnatum</i>)	20	5.5-7.0	clover	year round over 1500' fall-winter below 1500'
Clover, red (<i>Trifolium pratense</i>)	15	5.5-7.0	clover	year round over 1500' fall-winter below 1500'
Clover, rose (<i>Trifolium hirtum</i>) cv. 'Hykon', 'Kondinin', 'Sirint', 'Wilton'	20	5.0-7.0	clover	year round
Clover, white (<i>Trifolium repens</i>) cv. 'Haifa', 'Grasslands Huia'	10	5.5-7.0	clover	year round over 1500' fall-winter below 1500'
Cowpea (<i>Vigna unguiculata</i>)	60	5.5-7.0	cowpea	year round to 1000' spring-summer to 2000'
Lablab (<i>Lablab purpureus</i>)	60	4.5-6.5	lablab	year round to 1000' spring-summer to 2000'
Sunn hemp (<i>Crotalaria juncea</i>) cv. 'Tropic Sun'	40	5.0-7.0	cowpea	year round to 1000' spring-summer to 2000'
Trefoil, big (<i>Lotus pendunculatus</i>) cv. 'Grasslands Maku'	10	5.0-7.0	lotus specific	year round over 1500' fall-winter below 1500'
Trefoil, narrowleaf (<i>Lotus tenuis</i>)	10	5.0-7.0	lotus	year round over 1500' fall-winter below 1500'
Vetch (<i>Vicia villosa</i> , <i>V. dasycarpa</i>) cv. 'Lana', 'Namoi'	40	4.5-6.5	vetch	year round over 1500' fall-winter below 1500'

TABLE 3.—Cover Crop Plants for Interseeding in Sugarcane
(continued)

Species and Cultivars	Seeding Rates 1/ lbs. PLS/Ac	pH Range	Inoculant Group	Optimum Planting Time
NONLEGUMES:				
Barley (<i>Hordeum vulgare</i>)	70	5.5-7.0		year round over 2000' fall-winter below 2000'
Buckwheat (<i>Fagopyrum esculentum</i>) cv. Japanese, Common	60	4.5-6.5		year round
Oats, Common (<i>Avena sativa</i>)	70	5.5-7.0		year round over 2000' fall-winter below 2000'
Oats, red (<i>Avena byzantina</i>)	70	5.5-7.0		year round over 2000' fall-winter below 2000'
Ryegrass, annual (<i>Lolium multiflorum</i>)	30	5.5-7.0		year round over 2000' fall-winter below 2000'
Ryegrass, annual (<i>Lolium rigidum</i>) cv. 'Wimmera 62'	30	5.5-7.0		year round over 2000' fall-winter below 2000'
Wheat (<i>Triticum sativum</i>) cv. 'Florida 301'	70	5.5-7.0		year round over 2000' fall-winter below 2000'

1/ Seeding rate if broadcast or close drilled with 3-ft. wide band between rows.
If broadcast uniformly, then seeding rates may be reduced by 50 percent.

10. Mulching - (P)

Applying plant residues or other suitable materials not produced on the site to the soil surface. See existing FOTG Section IV Code 484 - Mulching for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane at all field office locations. At the present time, the use of organic mulch on truck crops meets the Code 484 Standards and Specifications only as practiced on Guam and the CNMI. Thus, this practice is limited to use for truck crops at the Guam and CNMI field offices for FSA planning purposes.

12. Conservation Cropping Sequence - (P)

An adapted sequence of crops designed to provide adequate organic residue for maintenance or improvement of soil tilth. FOTG Section IV Standards and Specifications for Code 328 - Conservation Cropping System apply to this practice. This practice does not reduce soil erosion in any measurable way. It will however, be included in every truck crop alternative conservation system (ACS) because it is a mandatory practice needed to protect the resource base. This practice is not applicable for sugarcane.

14. Contour Farming (with Raised Beds) - (P)

Farming sloping land in such a way that preparing land, planting, and cultivating are done on the contour. (This includes following established grades of terraces or diversions.) For FSA planning purposes, this practice also entails forming raised planting beds which follow the contour. FOTG Section IV Standards and Specifications Code 330 - Contour Farming apply to this practice. This practice is applicable for truck crops at all field office locations. It is not applicable for sugarcane.

15. Strip Till - (T)

Strip till is a type of conservation tillage. Conservation Tillage Standards and Specifications for Hawaii have not been developed, thus the following Standards for strip till will be included in Section III and used only for FSA planning purposes. This treatment is applicable for truck crops at all field office locations. It is not applicable for sugarcane.

STANDARDS

Definition

A tillage and planting system in which crops are grown between strips of dead grasses or weeds, standing crop residue, or volunteer or seeded cover crops.

Purpose

To reduce soil erosion; help maintain or develop good soil tilth, efficient moisture use, and water quality; and provide food and cover for wildlife.

Conditions Where Treatment Applies

On all truck crop land where vegetation is to be established or reestablished.

Planning Considerations

From one-third to three-fourths of a field must be maintained in the strips throughout the year. This treatment must be carried out on the contour or across the predominant slope.

16. No Till - (T)

No till is a type of conservation tillage. Conservation Tillage Standards and Specifications for Hawaii have not been developed, thus the following Standards for no till will be included in Section III and used for FSA planning purposes only. This treatment is applicable for truck crops at all field office locations. It is not applicable for sugarcane.

STANDARDS

Definitions

Planting and growing a crop in a field that has not been tilled since the harvest of the previous crop. No tillage can be done during the growing season of the crop.

Purpose

To reduce soil erosion; help maintain or develop good soil tilth, efficient moisture use, and water quality; and provide food and cover for wildlife.

Conditions Where Treatment Applies

On all truck crop land where vegetation is to be established or reestablished.

17. Chiseling and Subsoiling (Chiseling) - (P)

Loosening the soil, without inverting and with a minimum of mixing of the surface soil, to shatter restrictive layers below normal plow depth that inhibit water movement or root development. On suitable soils, chiseling is applicable if restrictive soil layers are less than 16 inches deep. FOTG Section IV Standards and Specifications Code 324 - Chiseling and Subsoiling apply to this practice. For FSA planning purposes, this practice is applicable for sugarcane at all field office locations. It is not applicable for truck crops.

18. Chiseling and Subsoiling (Deep Plowing) - (P)

Loosening the soil, without inverting and with a minimum of mixing of the surface soil, to shatter restrictive layers below normal plow depth that inhibit water movement or root development. On suitable soils, subsoiling is applicable if restrictive soil layers are more than 16 inches deep. FOTG Section IV Standards and Specifications Code 324 - Chiseling and Subsoiling apply to this practice. For FSA planning purposes, this practice is applicable for sugarcane at all field office locations. It is not applicable for truck crops.

STRUCTURAL PRACTICES AND TREATMENTS

20. Grassed Waterway - (P)

A natural or constructed channel that is shaped or graded to required dimensions and established in suitable vegetation for the stable conveyance of runoff. See existing FOTG Section IV Code 412 - Grassed Waterway for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane and truck crops at all field office locations.

21. Watercourse - (T)

This treatment is not covered by existing Section IV Standards and Specifications. For FSA planning purposes, it is applicable for sugarcane at all field office locations. It is not applicable for truck crops. Following are Standards for this treatment.

STANDARDS

Definition

A natural channel within cultivated sugarcane fields that has not been shaped or graded and is maintained in natural vegetation or sugarcane for the stable conveyance of runoff. Water from structural measures cannot be outletted into these watercourses.

Purpose

To reduce ephemeral gully erosion in natural channels.

Conditions Where Treatment Applies

On sugarcane land with complex topography, where constructing a grassed waterway is not practical or feasible.

DESIGN CRITERIA

Vegetation

The watercourse cross section must be maintained in natural vegetation or planted in sugarcane. The sugarcane can be harvested as long as adequate groundcover remains. The sugarcane cannot be clean-tilled if replanting is necessary.

Capacity

The watercourse must have adequate capacity to convey the expected runoff without causing erosion.

Width

Conservation plans must specify the required watercourse width to be maintained.

22. Diversion - (P)

A channel constructed across the slope with a supporting ridge on the lower side. For FSA planning purposes, this practice refers to a system of in-field diversions. See existing FOTG Section IV Code 362 - Diversion for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane at all field office locations. It is not commonly used for truck crops and is therefore not applicable for FSA planning purposes.

23. Diversion (for Outside Water) - (P)

A channel constructed across the slope with a supporting ridge on the lower side. For FSA planning purposes, this practice refers to a single diversion located at the top of a field to keep outside water from entering. FOTG Section IV Standards and Specifications Code 362 - Diversion apply to this practice. This practice is applicable for sugarcane and truck crops at all field office locations.

24. Terrace (Gradient) - (P)

An earth embankment, a channel, or a combination ridge and channel constructed across the slope. For FSA planning purposes, this practice refers to a system of in-field gradient-type terraces. Standards and Specifications for this practice are included in the FOTG Section IV under Code 600 - Terrace and Code 600 - Terrace Specifications. This practice is applicable for sugarcane and truck crops at all field office location.

25. Access Road - (P)

A travelway constructed as a part of a conservation plan. See existing FOTG Section IV Code 560 - Access Road for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane and truck crops at all field office locations.

26. Grade Stabilization Structure - (P)

A structure to control the grade and head cutting in natural or artificial channels. See existing FOTG Section IV Code 410 - Grade Stabilization Structure for Standards and Specifications for this practice. This practice is applicable for sugarcane at all field office locations. It is not commonly used for truck crop production and is therefore not applicable for FSA planning purposes.

27. Vertical Drain and Sediment Basin - (P)

A vertical drain is a well, pipe, pit, or bore into pourous, underground strata into which drainage water can be discharged. A sediment basin is constructed to collect and store debris or sediment. See existing FOTG Section IV Code 630 - Vertical Drain and 350 - Sediment Basin for Standards and Specifications for these practices. For FSA planning purposes, these two practices will be considered one practice because they are usually applied together. This practice is applicable for truck crops at all field office locations. It is not commonly used for sugarcane production and is therefore not applicable for FSA planning purposes.

28. Hillside Ditch - (P)

A channel that has a supporting ridge on the lower side constructed across the slope at definite vertical intervals and gradient, with or without a vegetative barrier. See existing FOTG Section IV Code 423 - Hillside Ditch for Standards and Specifications for this practice. This practice is applicable for truck crops at all field office locations. It is not commonly used for sugarcane production and is therefore not applicable for FSA planning purposes.

29. Terrace (Gradient 100' Spacing) - (P)

An earth embankment, a channel, or a combination ridge and channel constructed across the slope. For FSA planning purposes, this practice refers to a system of in-field gradient-type terraces spaced a maximum of 100-feet apart. Standards and Specifications for this practice are included in the FOTG Section IV under Code 600 - Terrace and Code 600 - Terrace Specifications. This practice is applicable for sugarcane at all field office locations. It is not commonly used for truck crop production and is therefore not applicable for FSA planning purposes.

31. Terrace (Level) - (P)

An earth embankment, a channel, or a combination ridge and channel constructed across the slope. For FSA planning purposes, this practice refers to a system of in-field level-type terraces. Standards and Specifications for this practice are included in the FOTG Section IV under Code 600 - Terrace and Code 600 - Terrace Specifications. This practice is applicable for sugarcane at all field office locations. It is not commonly used for truck crop production and is therefore not applicable for FSA planning purposes.

32. Field Windbreak - (P)

A strip or belt of trees or shrubs established in or adjacent to a field. See existing FOTG Section IV Code 392 - Field Windbreak for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane and truck crops at all field office locations.

33. Lined Waterway or Outlet - (P)

A waterway or outlet having an erosion-resistant lining of concrete, stone, or other permanent material. The lined section extends up the side slopes to a designed depth. The earth above the permanent lining may be vegetated or otherwise protected. See existing FOTG Section IV Code 468 - Lined Waterway or Outlet for Standards and Specifications for this practice. For FSA planning purposes, this practice is applicable for sugarcane and truck crops at all field office locations.

34. Terrace (Bench) - (P)

An earth embankment, a channel, or a combination ridge and channel constructed across the slope. For FSA planning purposes this practice refers to a system of in-field bench-type terraces. Standards and Specifications for this practice are included in the FOTG Section IV under Code 600 - Terrace and Code 600 - Terrace Specifications. This practice is applicable for truck crops all field office locations. It is not commonly used for sugarcane production and is therefore not applicable for FSA planning purposes.

35. Permanent Vegetative Cover - (P)

Taking cropland out of production and establishing and maintaining permanent vegetative cover would achieve an acceptable erosion reduction level and can be considered an alternative to the application of an Alternative Conservation System. The following practices with existing FOTG Section IV Standards and Specifications are applicable on sugarcane and truck crop land to establish permanent vegetative cover:

Code 342 - Critical Area Planting - Planting vegetation such as trees, shrubs, vines, grasses, or legumes on highly erodible or critically eroding areas (does not include tree planting mainly for wood products).

Code 512 - Pasture and Hayland Planting - Establishing and reestablishing long-term stands of adapted species of perennial, biennial, or reseeding forage plants. (Includes pasture and hayland renovation. Does not include grassed waterways or outlets on cropland.)

Code 612 - Tree Planting - To set tree seedlings or cuttings in the soil.

In addition to above mentioned practices, volunteer or natural vegetation on idled or abandoned sugarcane or truck crop land can be maintained to provide a permanent vegetative cover. All field roads must be adequately maintained according to Code 560 - Access Road Standards and Specifications.